

REMARKS/ARGUMENTS

In the Office Action mailed May 5, 2005, claims 1-3, 8-11 and 17-19 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tezuka, and claims 1, 3-11, and 13-20 were rejected under 35 U.S.C. 103(a) as being obvious over JP 10-148307 in view of JP 57-43120 or US005511971A. Claims 1, 5, 8, 13, 14, 17 and 20 have been amended to more clearly define the invention. Claim 19 has been canceled and claim 18 amended to incorporate the subject matter of claim 19. Support for the amendments is found in the specification. No new matter is added.

Applicant has thoroughly reviewed the outstanding Office Action, including the Examiner's remarks and references cited therein. The following remarks and amendments are believed to be fully responsive to the Office Action. After entering the amendment, the claims currently pending in this application will be claims 1-3, 5-11, 13-18 and 20. All of the pending claims at issue are believed to be patentable over the cited references.

The undersigned does not speak or read the Japanese language, and is left to review the figures and the translations of the summaries of the Japanese references provided by the Examiner. With regard to the foreign references relied upon by the Examiner, these remarks are limited to the best of the undersigned's knowledge based upon a thorough review of the figures and the translations of the summaries of the foreign references as provided by the Examiner.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Examiner rejected claims 1-3, 8-11 and 17-19 under 35 U.S.C. § 102(b) as being anticipated by JP10-148307 ("Tezuka"). Applicant respectfully traverses these rejections.

"The claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros v. Union Oil Co. of California*, 814 F.2d 628, 631. (Fed.Cir. 1987); MPEP § 2131.

With respect to claims 1-3 and 8-9, Tezuka does not teach or suggest every aspect of Applicant's independent claim 1 and its dependent claims 2, 3 and 5-9. For example, claim 1

and its dependent claims recite a combination including, “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level.”

Tezuka does not appear to teach or suggest a combination including “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level.” In fact, on page 4 of the Office Action the Examiner states that “[Tezuka] does not disclose[] means to shut down burners when the unacceptable operating parameters are detected.” Thus, by the Examiner’s own admission, the reference does not teach or suggest all the elements of Applicant’s claim 1 and its dependent claims.

The Examiner further directs Applicant’s attention to Japanese reference 57-43120 (“Kawaguchi”). However, this reference does not appear to teach or suggest a combination including all the elements of Applicant’s claim 1 and its dependent claims. Kawaguchi discloses a system that “monitor[s] NO_x content in an exhaust at all times, controlling the air ratio when the NO_x value has exceeded a predetermined value, and changing the flow of exhaust to an exhaust gas duct having an NO_x eliminator.” Thus, the system in Kawaguchi “issues a command signal to adjust the amount of air to the burners ... and to control dampers,” but does not appear to “send[] a signal to the burner controller to shut down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level.” In this case, Kawaguchi does not teach or suggest all the elements of Applicant’s claim 1 and its dependent claims.

Neither Tezuka nor Kawaguchi teaches or suggests a combination including all the elements of Applicant’s independent claim 1 and its dependent claims. That is to say, each and every element as set forth in claim 1 and its dependent claims is not found in a single prior art reference. Therefore, at least for these reasons, Applicant respectfully requests that the rejections

of claim 1 and its dependent claims 2, 3 and 8-9 under 35 U.S.C. § 102 as being anticipated by Tezuka be withdrawn.

With respect to claims 10, 11 and 17, Tezuka does not teach or suggest every aspect of Applicant's independent claim 10 and its dependent claims 11-17. For example, independent claim 10 and its dependent claims recite a combination including "data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means." Tezuka does not appear to teach or suggest a combination including "data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means." Thus, the reference does not appear to teach or suggest all the elements of Applicant's claim 10 and its dependent claims.

The Examiner further directs Applicant's attention to Kawaguchi. However, this reference does not appear to teach or suggest a combination including all the elements of Applicant's claim 1 and its dependent claims. For example, as discussed above, independent claim 10 and its dependent claims recite a combination including "data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means." However, Kawaguchi does not appear to teach or suggest a combination including "data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means." Thus, the reference does not appear to teach or suggest all the elements of Applicant's claim 10 and its dependent claims.

Once again, neither Tezuka nor Kawaguchi teaches or suggests a combination including all the elements of Applicant's independent claim 10 and its dependent claims 11-17. That is to say, each and every element as set forth in claim 1 and its dependent claims is not found in a single prior art reference. Therefore, at least for these reasons, Applicant respectfully requests

that the rejections of claim 10 and its dependent claims 11 and 17 under 35 U.S.C. § 102 as being anticipated by Tezuka be withdrawn.

With respect to claims 18, Tezuka does not teach or suggest every aspect of Applicant's independent claim 18 and its dependent claim 20. For example, independent claim 18 and its dependent claim recite a combination including "detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step." Tezuka does not appear to teach or suggest a method including "detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step." Thus, the reference does not appear to teach or suggest all the elements of Applicant's claim 18 and its dependent claims.

The Examiner further directs Applicant's attention to Kawaguchi. However, this reference does not appear to teach or suggest a combination including all the elements of Applicant's claim 1 and its dependent claims. For example, as discussed above, independent claim 18 and its dependent claims recite a combination including "detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step." Kawaguchi does not appear to teach or suggest a method including "detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step." Thus, the reference does not appear to teach or suggest all the elements of Applicant's claim 18 and its dependent claims.

As above, neither Tezuka nor Kawaguchi teaches or suggests a combination including all the elements of Applicant's independent claim 18 and its dependent claim 20. That is to say, each and every element as set forth in claim 18 and its dependent claim is not found in a single prior art reference. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 18 under 35 U.S.C. § 102 as being anticipated by Tezuka be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 1, 3-11 and 13-20 were rejected under 35 U.S.C. § 103(a) as being obvious over JP10-148307 (“Tezuka”) in view of JP57-43120 (“Kawaguchi”) or US005511971A (“Benz, et al.”). Applicant respectfully traverses these rejections.

Claims 1, 3-11, 13-18 and 20 are patentable over Tezuka in view of Kawaguchi or Benz, et al., because the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. MPEP § 2142. In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves, or in the knowledge generally available to one of the ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations. MPEP § 2142; *see also* MPEP 2143. In light of the following arguments, the combined references do not teach or suggest all of the claim limitations of the present invention.

With regard to claims 1, 3 and 5-9, Tezuka in view of Kawaguchi or Benz, et al. does not teach or suggest every aspect of Applicant’s independent claim 1 and its dependent claims 2, 3 and 5-9. For example, claim 1 and its independent claims recite a combination including “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NOx emissions in the exhaust conduit are at or above a first predetermined level.”

As discussed above, neither Tezuka nor Kawaguchi appears to teach or suggest a combination including “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NOx emissions in the exhaust conduit are at or above a first predetermined level.” Furthermore, Benz, et al. does not cure the insufficiencies of Tezuka and Kawaguchi. Benz, et

al. discloses a system that includes a “pressure and acceleration transducer 78 [that] detects [flame] pulsations so that the computer may shut down the boiler and/or further close the damper 62 to maintain stable flame.” (*See* Benz, et al., col 5, ll. 53-56.) However, this is not that same as “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NOx emissions in the exhaust conduit are at or above a first predetermined level.”

Accordingly, Tezuka, Kawaguchi and Benz, et al., alone or in combination, fail to teach or suggest a combination including all the elements of Applicant’s independent claim 1 and its dependent claims 2, 3 and 5-9. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 1 and its dependent claims 3 and 5-9 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

With regard to claims 10, 11 and 13-17, Tezuka in view of Kawaguchi or Benz, et al. does not teach or suggest every aspect of Applicant’s independent claim 10 and its dependent claims 11 and 13-17. For example, claim 10 and its independent claims recite a combination including “data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means.”

As discussed above, neither Tezuka nor Kawaguchi appears to teach or suggest a combination including “data storing means operably connected to the system controlling means, wherein the system controlling means sends NOx information received from the NOx sensing means to the data storing means.” Furthermore, Benz, et al. does not cure the insufficiencies of Tezuka and Kawaguchi. Benz, et al. discloses a system that includes a computer that “maps out the ideal positions of the FGR and combustion air dampers and ideal fan speed for each firing level, by performing a preliminary mapping function in which the boiler is operated over the entire range of firing levels [and] then stores these (two separate sets of) values digitally.”

However, this is not the same as storing “NOx information received from the NOx sensing means” during normal operations.

Accordingly, Tezuka, Kawaguchi and Benz, et al., alone or in combination, fail to teach or suggest a combination including all the elements of Applicant’s independent claim 10 and its dependent claims 11 and 13-17. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 10 and its dependent claims 11 and 13-17 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

Similarly, with regard to claims 18 and 20, Tezuka in view of Kawaguchi or Benz, et al. do not teach or suggest every aspect of Applicant’s independent claim 18 and its dependent claim 20. For example, claim 18 and its independent claims recite a method including “detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step.”

As discussed above, neither Tezuka nor Kawaguchi appears to teach or suggest a method including “detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step.” Furthermore, Benz, et al. does not cure the insufficiencies of Tezuka and Kawaguchi. Benz, et al. discloses a system that includes a computer that “maps out the ideal positions of the FGR and combustion air dampers and ideal fan speed for each firing level, by performing a preliminary mapping function in which the boiler is operated over the entire range of firing levels [and] then stores these (two separate sets of) values digitally.” However, this is not the same as “detecting NOx emissions in exhaust associated with the burner [and] saving results obtained from the detecting step.”

Accordingly, Tezuka, Kawaguchi and Benz, et al., alone or in combination, fail to teach or suggest a combination including all the elements of Applicant’s independent claim 18 and its dependent claim 20. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 18 and its dependent claim 20 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

OFFICIAL NOTICE TAKEN BY THE EXAMINER

In making the above rejections based on 35 U.S.C. § 103, the Examiner took official notice that it is well known in the art to, *inter alia*:

- “shut down burners when the unacceptable operating parameters are detected in order to prevent unsafe or damaging burner operation”
- “use a microprocessor with a memory and stored operating values as a system controller”
- “system control means arranged to activate an alarm when system parameters are at an unacceptable level to notify maintenance personnel.”

Applicant respectfully traverses the Examiner’s position that the items cited above are well known in the art and merit official notice by the Examiner. In particular, Applicant rejects the Examiner’s notion that the above ideas are well known in the art of hydrocarbon-fired burners and appliances for a method of reducing NO_x emissions in appliances having a burner.

The Examiner may only rely on official notice unsupported by documentary evidence “where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known.” MPEP § 2144.03(A). “It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of ... specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art.” *Id.* Furthermore, “[i]t is never appropriate to rely solely on ‘common knowledge’ in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based.” *Id.* Moreover, “[i]f applicant adequately traverses the examiner’s

assertion of official notice, the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained.” MPEP 2144.03(C).

Regarding the Examiner’s assertion that it is well known to “shut down burners when the unacceptable operating parameters are detected in order to prevent unsafe or damaging burner operation,” Applicant’s independent claim 1 and its dependent claims 2, 3, and 5-9 recite a combination including “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level.” In addition, dependent claim 13 recites a combination including “means for controlling the burner operably connected to the system controlling means, wherein the system controlling means sends a signal to the burner controlling means to shut down the burner when the NO_x emissions in the exhausting means are at or above a predetermined level,” and dependent claim 20 recites a combination including “shutting down the burner, activating an alarm, and notifying maintenance personnel when the NO_x emissions are at or above a predetermined level.”

In support of the official notice, the Examiner cited US005002484 (“Lofton, et al.”), which discloses a system including “a temperature sensor 85 [that] monitors the temperature of the operating furnace to shut the system down if the temperature of the combined combustion air exceeds the rating of the blower.” (*See* Lofton, et al., col. 6, ll. 65-68.) In addition, the Examiner cited Itami, which discloses a system that “form[s] a fuzzy inference knowledge base from a causal relation between a sampling result of waste gas obtained from a test run of a boiler or the like and an operating state of each boiler.... When the indication is proper, the knowledge base decides the result of an actual waste gas sampling section 105 and the operating state of the burner is displayed on an indicator 106.” (*See* Itami, Abstract translation.) It is not clear that the system disclosed in Itami includes a safety shutdown function.

However, even if the official notice is considered appropriate for the sake of argument, “shut[ting] down ... in order to prevent unsafe or damaging burner operation” is not the same as

“shut[ting] down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level.” The examples cited by the Examiner, as well as the Examiner’s own wording, do not include shutting down a burner when the unacceptable operating parameters are detected in order to prevent undesirable burner operation. Therefore, Applicant requests that the Examiner provide references demonstrating that “shut[ting] down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level” is well-known in the art.

Thus, even if the official notice regarding “shut[ting] down burners] were appropriate, Tezuka, Kawaguchi and Benz, et al., alone or in combination with the official notice, would fail to teach or suggest a combination including all the elements of Applicant’s independent claim 1 and its dependent claims 2, 3, and 5-9, as well as dependent claims 13 and 20. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 1 and its dependent claims 3 and 5-9, as well as dependent claims 13 and 20 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

Furthermore, regarding the assertion that it is well known to “use a microprocessor with a memory and stored operating values as a system controller,” Applicant’s independent claim 10 and its dependent claims 11 and 13-17 recite a combination including “data storing means operably connected to the system controlling means, wherein the system controlling means sends NO_x information received from the NO_x sensing means to the data storing means.” In addition, independent claim 18 and its dependent claim 20 recites a combination including “detecting NO_x emissions in exhaust associated with the burner [and] saving results obtained from the detecting step,” and dependent claim 3 recites a combination “comprising a database operably connected to the system controller, wherein the system controller sends NO_x information received from the NO_x sensor to the database for storage.”

In support of the official notice, the Examiner cited Benz, et al., which discloses a system including a computer controller that , *inter alia*, processes signals representing the composition

of the stack gases (*See* Benz, et al., col. 4, ll. 56-57.), controls the variable frequency drive of the air fan (*See* Benz, et al., col. 4, ll. 60-63), controls the gas pressure of the main regulator (*See* Benz, et al., col. 5, ll. 10-13), controls the flow of combustion air into the fan inlet and the fuel flow rate, (*See* Benz, et al., col. 5, ll. 26-30), shuts down the boiler if necessary to maintain a stable flame, (*See* Benz, et al., col. 5, ll. 53-56). However, the Benz, et al. does not disclose a combination including a computer controller that “sends NO_x information received from the NO_x sensing means to the data storing means.” Thus, Benz, et al. does not disclose all of the elements in Applicant’s independent claim 10 and its dependent claims 11 and 13-17, independent claim 18 and its dependent claim 20, or dependent claim 3.

Moreover, Benz, et al. does not disclose a combination including “[a] burner controller operably connected to the system controller, wherein the system controller sends a signal to the burner controller to shut down the burner when the NO_x emissions in the exhaust conduit are at or above a first predetermined level,” as recited by Applicant’s claims (see above). Thus, in accordance with the above discussion, Benz, et al. does not disclose all of the elements in Applicant’s independent claim 1 and its dependent claims 2, 3, and 5-9, as well as dependent claims 13 and 20.

Thus, even if the official notice regarding “us[ing] a microprocessor ... as a system controller” were appropriate, Tezuka, Kawaguchi and Benz, et al., alone or in combination with the official notice, would fail to teach or suggest a combination including all the elements of Applicant’s independent claim 1 and its dependent claims 2, 3, and 5-9; independent claim 10 and its dependent claims 11 and 13-17; or independent claim 18 and its dependent claim 20. Therefore, at least for these reasons, Applicant respectfully requests that the rejections of claim 1 and its dependent claims 2, 3 and 5-9; claim 10 and its dependent claims 11 and 13-17; and claim 18 and its dependent claim 20 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

Finally, regarding the assertion that it is well known to use “system control means arranged to activate an alarm when system parameters are at an unacceptable level to notify maintenance personnel,” the Examiner has provided no supporting documentation. Applicant has traversed Examiner’s assertion that “system control means arranged to activate an alarm when system parameters are at an unacceptable level to notify maintenance personnel” is well-known in the art. For example, none of the references relied upon by the Examiner appear to include such an alarm. Therefore, Applicant requests that the Examiner provide references supporting this assertion. Further, the Examiner’s assertion is a general one. Nowhere in the Examiner’s assertion is a combination including a “system controller [or controlling means that] activates an alarm when the NOx emissions in the exhaust conduit are at or above a [] predetermined level” mentioned. Therefore, Applicant respectfully request that the Examiner provide evidence to support official notice of a “system controller [or controlling means that] activates an alarm when the NOx emissions in the exhaust conduit are at or above a [] predetermined level.”

Applicant’s dependent claims 5 and 14 recite a combination “wherein the system controller [or controlling means] activates an alarm when the NOx emissions in the exhaust conduit are at or above a [second] predetermined level.” Similarly, Applicant’s dependent claim 20 recites a method including “activating an alarm ... when the NOx emissions are at or above a predetermined level.” Therefore, in the absence of documentation supporting the Examiner’s assertion regarding “activat[ing] an alarm,” without any further admission, Applicant requests, at least for these reasons that the rejections of dependent claims 5, 14 and 20 under 35 U.S.C. § 103 as being obvious over Tezuka in view of Kawaguchi or Benz, et al. be withdrawn.

CONCLUSION

In view of the foregoing remarks, The applicant respectfully requests that all the objections and rejections to the claims be removed and that the claims pass to allowance. If, for

any reason, the Examiner disagrees, please call the undersigned attorney at 202-861-1567 in an effort to resolve any matter still outstanding before issuing another action. The undersigned Attorney is confident that any issue which might remain can readily be worked out by telephone.

In the event this paper is not timely filed, applicant petitions for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036.

Respectfully submitted,

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